

Sup. 1891.

Mr. Marth, Satellites of Saturn.

565

Greenwich, Noon.	Selenographical		Geocentric		Libration. Combined Amount.	Direction.
	Colong. of the Sun.	Lat.	Sel. Long. of the Earth.	Lat.		
1891. Nov. 24	189°38	-0°18	+3°12	-6°48	7°18	205°6
25	201°55	21	1°82	5°89	6°17	197°1
26	213°73	23	+0°49	5°06	5°09	185°6
27	225°92	26	-0°81	-4°01	4°09	168°7
Dec. 7	347°80	-0°51	-3°47	+6°78	7°61	26°7
8	359°96	54	2°59	6°48	6°98	21°7
9	12°11	56	1°60	5°79	6°00	15°4
10	24°26	59	-0°51	4°73	4°76	6°2
11	36°40	62	+0°61	3°38	3°43	349°8
12	48°54	65	1°75	1°81	2°52	316°1
13	60°67	-0°68	+2°82	+0°14	2°82	272°9
14	72°80	71	3°77	-1°52	4°07	248°0
15	84°93	74	4°55	3°07	5°49	235°9
16	97°05	77	5°08	4°42	6°73	228°9
17	109°18	80	5°34	5°48	7°65	224°1
18	121°31	82	5°27	6°23	8°15	220°1
19	133°45	85	4°88	6°64	8°24	216°2
20	145°59	-0°87	+4°19	-6°73	7°92	211°8
21	157°73	90	3°23	6°51	7°26	206°3
22	169°88	92	2°05	6°00	6°34	198°8
23	182°04	94	+0°77	5°24	5°31	188°7
24	194°20	96	-0°58	4°26	4°30	172°3
25	206°37	-0°98	-1°89	-3°10	3°63	148°7

Ephemerides of the Satellites of Saturn, 1891-92. By A. Marth.

Though the proper determination of the plane of *Saturn's* equator as the fundamental plane to which the orbits of the satellites are to be referred may have to be postponed till the results of the observations of 1892 shall have become available, the values of the nodes and inclinations of the orbits of *Tethys*, *Rhea*, and *Enceladus*, which Dr. Hermann Struve has deduced from his observations made during the four oppositions of 1886-89, and of which he has given some account in his papers published in Nos. 2945-46 and 2983-84 of the *Astronomische Nachrichten*, indicate the position of the planet's equator well enough to allow some fairly approximate assumption to be made, quite independently of any observations of the ring. The values of

the node and inclination of the fundamental plane adopted in the following ephemerides are, in reference to the planes parallel to the equator and the ecliptic,

	N.	Equator. J.	Node.	Ecliptic. Inclin.	
1892.0	125° 9363	6° 9526	167° 0785	28° 0711	1° 1786
or 1891 Oct. 14	125° 9278	6° 9536	167° 9755	28° 0711	1° 1789
92 Aug. 9	125° 9603	6° 9499	167° 9870	28° 0710	1° 1778

The longitudes l , L , Λ of the ephemerides being referred to the equator, the angle $1^{\circ} 1786$ given in the last column must be subtracted, if they are to be referred to the ecliptic.

In the following tables P denotes the position-angle of the axis of *Saturn*, $L + 180^{\circ}$ the planetocentric longitude of the Earth referred to the assumed fundamental plane, $\Lambda + 180^{\circ}$ that of the Sun or $\Lambda - L$ the difference between the two. B and B denote the planetocentric latitude of the Earth and Sun above the fundamental plane. The last column gives the longitude of *Saturn's* central meridian corrected for phase.

Greenwich Noon.	P	L	B	B	$\Lambda - L$	Long. of h Central Merid. Diff.	
1891.							
Oct. 14	355° 495	175° 592	+ 1° 217	- 0° 217	- 2° 313	39° 51	1687° 45
16	° 515	175° 799	1° 321	0° 186	2° 459	286° 96	° 46
18	° 535	176° 003	1° 424	0° 155	2° 602	174° 42	° 46
20	° 554	176° 205	1° 526	0° 124	2° 743	61° 88	° 47
22	° 573	176° 405	1° 626	0° 093	2° 882	309° 35	° 47
24	355° 592	176° 603	+ 1° 724	- 0° 063	- 3° 018	196° 82	° 48
26	° 611	176° 798	1° 821	- 0° 032	3° 152	84° 30	° 48
28	° 630	176° 990	1° 916	- 0° 001	3° 284	331° 78	° 49
30	° 648	177° 180	2° 010	+ 0° 029	3° 412	219° 27	° 49
Nov. 1	° 666	177° 367	2° 102	0° 060	3° 538	106° 76	° 50
3	355° 684	177° 550	+ 2° 191	+ 0° 091	- 3° 660	354° 26	1687° 51
5	° 701	177° 730	2° 279	0° 122	3° 779	241° 77	° 52
7	° 718	177° 907	2° 365	0° 152	3° 894	129° 29	° 52
9	° 735	178° 080	2° 448	0° 183	4° 006	16° 81	° 52
11	° 752	178° 249	2° 529	0° 214	4° 115	264° 33	° 53
13	355° 768	178° 415	+ 2° 608	+ 0° 244	- 4° 219	151° 86	° 54
15	° 784	178° 576	2° 685	0° 275	4° 320	39° 40	° 54
17	° 799	178° 734	2° 759	0° 306	4° 416	286° 94	° 55
19	° 814	178° 887	2° 831	0° 337	4° 508	174° 49	° 56
21	° 829	178° 036	2° 900	0° 367	4° 596	62° 05	° 56
23	355° 843	179° 180	+ 2° 967	+ 0° 398	- 4° 679	309° 61	1687° 57
25	° 857	179° 320	3° 031	0° 429	4° 758	197° 18	° 58

Sup. 1891.		Satellites of Saturn, 1891-92.					567
Greenwich Noon.	P	L	B .	B	A-L	Long. of h Central Merid. Diff.	
1891. Nov. 27	355°870	179°455	+ 3°092	+ 0°459	- 4°832	84°76	1687°58
29	°883	179°585	3°151	0°490	4°901	332°34	°59
Dec. 1	°895	179°710	3°207	0°521	4°965	219°93	°59
3	355°907	179°830	+ 3°260	+ 0°551	- 5°024	107°52	°60
5	°919	179°944	3°310	0°582	5°077	355°12	°61
7	°930	180°053	3°357	0°613	5°125	242°73	°61
9	°940	180°157	3°401	0°643	5°168	130°34	°62
11	°950	180°255	3°442	0°674	5°205	17°96	°62
13	355°959	180°347	+ 3°480	+ 0°705	- 5°236	265°58	1687°63
15	°968	180°433	3°515	0°735	5°262	153°21	°64
17	°976	180°514	3°546	0°766	5°282	40°85	°64
19	°983	180°589	3°575	0°797	5°295	288°49	°65
21	°990	180°658	3°600	0°827	5°303	176°14	°66
23	355°996	180°720	+ 3°622	+ 0°858	- 5°305	63°80	1687°66
25	356°002	180°776	3°640	0°888	5°300	311°46	°67
27	°007	180°826	3°655	0°919	5°287	199°13	°67
29	°011	180°870	3°667	0°950	5°272	86°80	°68
31	°015	180°907	3°676	0°980	5°248	334°48	°68
1892. Jan. 2	356°018	180°938	+ 3°681	+ 1°011	- 5°218	222°16	1687°69
4	°020	180°962	3°683	1°041	5°181	109°85	°69
6	°022	180°980	3°681	1°072	5°138	357°54	°70
8	°023	180°991	3°676	1°102	5°088	245°24	°70
10	°023	180°995	3°668	1°133	5°032	132°94	°71
12	356°023	180°993	+ 3°656	+ 1°164	- 4°969	20°65	°72
14	°022	180°985	3°641	1°194	4°900	268°37	°72
16	°021	180°970	3°623	1°225	4°825	156°09	°72
18	°019	180°949	3°602	1°255	4°743	43°81	°73
20	°016	180°922	3°577	1°286	4°655	291°54	°73
22	356°013	180°888	+ 3°549	+ 1°316	- 4°560	179°27	1687°73
24	°009	180°848	3°518	1°347	4°459	67°00	°74
26	356°004	180°802	3°484	1°377	4°352	314°74	°74
28	355°999	180°750	3°447	1°408	4°239	202°48	°74
30	°993	180°691	3°407	1°438	4°120	90°22	°75
Feb. 1	355°986	180°627	+ 3°364	+ 1°469	- 3°995	337°97	°75
3	°979	180°557	3°319	1°499	3°864	225°72	°75
5	°972	180°482	3°271	1°530	3°728	113°47	°76
7	°964	180°401	3°220	1°560	3°586	1°23	°76

Greenwich Noon.	P	L	B ·	B	Λ-L	Long. of ♄ Central Merid. Diff.
1892. Feb. 9	355°955	180°315	+ 3°167	+ 1°591	- 3°440	248°99 1687°76
11	355°946	180°224	+ 3°111	+ 1°621	- 3°288	136°75 1687°76
13	°936	180°128	3°053	1°652	3°132	24°51 °76
15	°926	180°028	2°993	1°682	2°971	272°27 °76
17	°916	179°924	2°931	1°713	2°805	160°03 °76
19	°905	179°815	2°867	1°743	2°636	47°79 °77
21	355°894	179°702	+ 2°801	+ 1°774	- 2°462	295°56 °76
23	°882	179°585	2°734	1°804	2°284	183°32 °76
25	°870	179°465	2°665	1°834	2°103	71°08 °76
27	°858	179°341	2°595	1°865	1°919	318°84 °76
29	°845	179°215	2°524	1°895	1°732	206°60 1687°76
Mar. 2	388°832	179°086	+ 2°451	+ 1°926	- 1°543	94°36

The daily rate of rotation adopted in the computation of the Central Meridian is $843^{\circ}80$, corresponding to a period of $10^h 14^m 36.4$. It approximately represents the motion of the spots observed by Mr. A. Stanley Williams, the account of which is published in No. 3051 of the *Astron. Nachrichten*.

The values referring to the ball and ring depend on Bessel's old determinations. In the tables for the five inner satellites, a and b denote the semiaxes of the apparent orbits, $l-L$ the orbital longitudes of the satellites reckoned from the points which are in superior conjunction with the planet's centre or in opposition to the Earth in longitude. By adding to $l-L$ the value of L from the preceding table, the longitudes l are found, which are corrected for the equation of light.

Greenwich Noon.	Semidiameter of Ball.			Semiaxis of Ring.		<i>Mimas.</i>			Diff.
	Equat.	Phase.	Polar.	Major.	Minor.	a_1	b_1	$l_1 - L$	
1892. Oct. 14	7°90	0°006	7°12	18°20	0°39	24°88	+ 0°53	125°42	763°83
16	7°91	°007	7°13	18°23	0°42	24°91	0°58	169°25	°84
18	7°92	°008	7°15	18°26	0°45	24°95	0°62	213°09	°84
20	7°93	°009	7°16	18°29	0°49	24°99	0°67	256°93	°84
22	7°95	°010	7°17	18°32	0°52	25°04	0°71	300°77	°85
24	7°96	°011	7°18	18°36	0°55	25°08	+ 0°76	344°62	°85
26	7°98	°012	7°20	18°39	0°58	25°13	0°80	28°47	°86
28	7°99	°013	7°21	18°43	0°62	25°18	0°85	72°33	°86
30	8°01	°014	7°23	18°47	0°65	25°23	0°89	116°19	°86
Nov. 1	8°03	°015	7°24	18°51	0°68	25°29	0°93	160°05	°87
3	8°05	°016	7°26	18°55	0°71	25°35	+ 0°97	203°92	763°88
5	8°07	°018	7°28	18°59	0°74	25°41	1°01	247°80	°88

Sup. 1891.

Satellites of Saturn, 1891-92.

569

Greenwich Noon.	Semidiameter of Ball.			Semiaxis of Ring.		Mimas.			Diff.
	Equat.	Phase.	Polar.	Major.	Minor.	a_1	b_1	l_1-L	
1891. Nov. 7	8''09	0''019	7''29	18''64	0''77	25''47	+1''05	291°68	763°89
9	8.11	.020	7.31	18.68	0.80	25.53	1.09	335.57	.89
11	8.13	.021	7.33	18.73	0.83	25.60	1.13	19.46	.90
13	8.15	.022	7.35	18.78	0.86	25.66	+1.17	63.36	.90
15	8.17	.023	7.37	18.83	0.88	25.73	1.21	107.26	.91
17	8.19	.024	7.39	18.88	0.91	25.80	1.24	151.17	.91
19	8.21	.025	7.41	18.94	0.94	25.88	1.28	195.08	.92
21	8.24	.026	7.43	18.99	0.96	25.95	1.32	239.00	.92
23	8.26	.027	7.46	19.05	0.99	26.03	+1.35	282.92	763.93
25	8.29	.028	7.48	19.11	1.01	26.11	1.38	326.85	.93
27	8.31	.029	7.50	19.17	1.03	26.19	1.41	10.78	.94
29	8.34	.030	7.52	19.23	1.06	26.27	1.44	54.72	.95
Dec. 1	8.37	.031	7.55	19.29	1.08	26.36	1.47	98.67	.96
3	8.39	.032	7.57	19.35	1.10	26.44	+1.50	142.63	.96
5	8.42	.033	7.60	19.41	1.12	26.53	1.53	186.59	.96
7	8.45	.034	7.62	19.48	1.14	26.62	1.56	230.55	.97
9	8.48	.034	7.65	19.54	1.16	26.71	1.58	274.52	.98
11	8.51	.035	7.68	19.61	1.18	26.80	1.61	318.50	.98
13	8.54	.036	7.70	19.68	1.19	26.89	+1.63	2.48	763.99
15	8.57	.036	7.73	19.75	1.21	26.98	1.65	46.47	764.00
17	8.60	.037	7.76	19.81	1.23	27.08	1.67	90.47	.00
19	8.63	.037	7.78	19.88	1.24	27.17	1.69	134.47	.01
21	8.66	.037	7.81	19.95	1.25	27.27	1.71	178.48	.02
23	8.69	.037	7.84	20.02	1.26	27.36	+1.73	222.50	.02
25	8.72	.037	7.87	20.10	1.27	27.46	1.74	266.52	.03
27	8.75	.037	7.89	20.17	1.28	27.56	1.76	310.55	.03
29	8.78	.037	7.92	20.24	1.29	27.66	1.77	324.58	.04
31	8.81	.037	7.95	20.31	1.30	27.76	1.78	38.62	.04
1892. Jan. 2	8.84	0.037	7.98	20.38	1.31	27.85	+1.79	82.66	764.05
4	8.87	.036	8.01	20.45	1.31	27.95	1.80	126.71	.06
6	8.90	.036	8.04	20.53	1.32	28.05	1.80	170.77	.06
8	8.94	.035	8.06	20.60	1.32	28.15	1.80	214.83	.07
10	8.97	.035	8.09	20.67	1.32	28.25	1.81	258.90	.08
12	9.00	.034	8.12	20.74	1.32	28.35	+1.81	302.98	.08
14	9.03	.033	8.15	20.81	1.32	28.44	1.81	347.06	.08
16	9.06	.032	8.17	20.88	1.32	28.54	1.80	31.14	.09
18	9.09	.031	8.20	20.95	1.32	28.63	1.80	75.23	.10

Greenwich Noon.	Semidiameter of Ball.			Semiaxis of Ring.		<i>Mimas.</i>			Diff.
	Equat.	Phase.	Polar.	Major.	Minor.	a_1	b_1	$l_1 - L$	
1892.									
Jan. 20	9'12	0''030	8'23	21'02	1'31	28'72	+ 1''79	119°33	764'10
22	9'15	0'029	8'25	21'09	1'31	28'81	+ 1'78	163'43	764'10
24	9'18	0'028	8'28	21'15	1'30	28'90	1'77	207'53	11
26	9'20	0'027	8'31	21'22	1'29	28'99	1'76	251'64	12
28	9'23	0'025	8'33	21'28	1'28	29'08	1'75	295'76	12
30	9'26	0'024	8'35	21'34	1'27	29'16	1'73	339'88	12
Feb. 1	9'29	0'023	8'38	21'40	1'26	29'25	+ 1'72	24'00	13
3	9'31	0'021	8'40	21'46	1'24	29'33	1'70	68'13	13
5	9'34	0'020	8'42	21'52	1'23	29'41	1'68	112'26	13
7	9'36	0'018	8'44	21'57	1'21	29'48	1'66	156'39	14
9	9'38	0'017	8'46	21'63	1'20	29'55	1'63	200'53	14
11	9'40	0'015	8'48	21'68	1'18	29'62	+ 1'61	244'67	764'14
13	9'42	0'014	8'50	21'73	1'16	29'69	1'58	288'81	15
15	9'44	0'013	8'52	21'77	1'14	29'75	1'55	332'96	15
17	9'46	0'011	8'54	21'82	1'12	29'81	1'52	17'11	15
19	9'48	0'010	8'56	21'86	1'09	29'87	1'49	61'26	15
21	9'50	0'009	8'57	21'90	1'07	29'92	+ 1'46	105'41	15
23	9'51	0'008	8'58	21'93	1'05	29'97	1'43	149'56	15
25	9'53	0'007	8'60	21'97	1'02	30'02	1'40	193'71	15
27	9'54	0'005	8'61	22'00	1'00	30'06	1'36	237'86	16
29	9'55	0'004	8'62	22'02	0'97	30'10	1'33	282'02	764'15
Mar. 2	9'56	0'003	8'63	22'05	0'94	30'13	+ 1'29	326'17	

*Enceladus.**Tethys.*

Greenwich Noon.				Diff.				Diff.
	a_2	b_2	$l_2 - L$		a_3	b_3	$l_3 - L$	
1891.								
Oct. 14	31'91	+ 0''68	202°32	525'28	39'50	+ 0''84	119°289	381'205
16	31'96	0'74	7'60	28	39'56	0'91	120'494	208
18	32'01	0'80	172'88	29	39'62	0'99	161'702	212
20	32'06	0'86	338'17	29	39'69	1'06	182'914	215
22	32'12	0'91	143'46	29	39'76	1'13	204'129	218
24	32'18	+ 0'97	308'75	30	39'83	+ 1'20	225'347	221
26	32'24	1'02	114'05	30	39'91	1'27	246'568	225
28	32'30	1'08	279'35	31	39'99	1'34	267'793	229
30	32'37	1'14	84'66	31	40'07	1'41	289'022	233
Nov. 1	32'44	1'19	249'97	32	40'16	1'47	310'255	237
3	32'52	+ 1'24	55'29	525'32	40'25	+ 1'54	331'492	381'241
5	32'59	1'30	220'61	32	40'34	1'60	352'733	245
7	32'67	1'35	25'93	33	40'44	1'67	13'978	250

Sup. 1891.

Satellites of Saturn, 1891-92.

571

<i>Enceladus.</i>					<i>Tethys.</i>				
Greenwich Noon. 1891.	a_2	b_2	l_2-L	Diff.	a_3	b_3	l_3-L	Diff.	
Nov. 9	32 ^h 75	+1 ^m 40	291 ^s 26	525 ^o 33	40 ^h 54	+1 ^m 73	35 ^s 228	381 ^o 254	
11	32 ^h 84	1 ^m 45	356 ^s 59	34	40 ^h 65	1 ^m 79	56 ^s 482	258	
13	32 ^h 92	+1 ^m 50	161 ^s 93	34	40 ^h 76	+1 ^m 85	77 ^s 740	263	
15	33 ^h 01	1 ^m 55	327 ^s 27	35	40 ^h 87	1 ^m 91	99 ^s 003	268	
17	33 ^h 10	1 ^m 60	132 ^s 62	35	40 ^h 98	1 ^m 97	120 ^s 271	273	
19	33 ^h 20	1 ^m 64	297 ^s 97	36	41 ^h 10	2 ^m 03	141 ^s 544	278	
21	33 ^h 29	1 ^m 69	103 ^s 33	36	41 ^h 22	2 ^m 09	162 ^s 822	283	
23	33 ^h 39	+1 ^m 73	268 ^s 69	525 ^o 37	41 ^h 34	+2 ^m 14	184 ^s 105	381 ^o 288	
25	33 ^h 49	1 ^m 77	74 ^s 06	38	41 ^h 46	2 ^m 19	205 ^s 393	293	
27	33 ^h 60	1 ^m 81	239 ^s 44	38	41 ^h 59	2 ^m 24	226 ^s 686	299	
29	33 ^h 70	1 ^m 85	44 ^s 82	39	41 ^h 72	2 ^m 29	247 ^s 985	304	
Dec. 1	33 ^h 81	1 ^m 89	210 ^s 21	39	41 ^h 85	2 ^m 34	269 ^s 289	310	
3	33 ^h 92	+1 ^m 93	15 ^s 60	39	41 ^h 99	+2 ^m 39	290 ^s 599	315	
5	34 ^h 03	1 ^m 97	180 ^s 99	41	42 ^h 13	2 ^m 43	311 ^s 914	321	
7	34 ^h 14	2 ^m 00	346 ^s 40	41	42 ^h 27	2 ^m 48	333 ^s 235	328	
9	34 ^h 26	2 ^m 03	151 ^s 81	41	42 ^h 41	2 ^m 52	354 ^s 563	333	
11	34 ^h 38	2 ^m 06	317 ^s 22	42	42 ^h 55	2 ^m 56	15 ^s 896	338	
13	34 ^h 50	+2 ^m 09	122 ^s 64	525 ^o 43	42 ^h 70	+2 ^m 59	37 ^s 234	381 ^o 345	
15	34 ^h 62	2 ^m 12	288 ^s 07	43	42 ^h 85	2 ^m 63	58 ^s 579	351	
17	34 ^h 74	2 ^m 15	93 ^s 50	44	43 ^h 00	2 ^m 66	79 ^s 930	357	
19	34 ^h 86	2 ^m 18	258 ^s 94	45	43 ^h 15	2 ^m 69	101 ^s 287	362	
21	34 ^h 98	2 ^m 20	64 ^s 39	45	43 ^h 30	2 ^m 72	122 ^s 649	369	
23	35 ^h 10	+2 ^m 22	229 ^s 84	46	43 ^h 45	+2 ^m 75	144 ^s 018	376	
25	35 ^h 23	2 ^m 24	35 ^s 30	46	43 ^h 61	2 ^m 77	165 ^s 394	381	
27	35 ^h 35	2 ^m 26	200 ^s 76	47	43 ^h 76	2 ^m 79	186 ^s 775	388	
29	35 ^h 48	2 ^m 27	6 ^s 23	48	43 ^h 92	2 ^m 81	208 ^s 163	394	
31	35 ^h 61	2 ^m 28	171 ^s 71	48	44 ^h 08	2 ^m 83	229 ^s 557	400	
1892. Jan. 2	35 ^h 73	+2 ^m 29	337 ^s 19	525 ^o 49	44 ^h 23	+2 ^m 84	250 ^s 957	381 ^o 406	
4	35 ^h 86	2 ^m 30	142 ^s 68	49	44 ^h 39	2 ^m 85	272 ^s 363	413	
6	35 ^h 98	2 ^m 31	308 ^s 17	50	44 ^h 54	2 ^m 86	293 ^s 776	419	
8	36 ^h 11	2 ^m 31	113 ^s 67	51	44 ^h 70	2 ^m 87	315 ^s 195	425	
10	36 ^h 24	2 ^m 32	279 ^s 18	51	44 ^h 86	2 ^m 87	336 ^s 620	431	
12	36 ^h 36	+2 ^m 32	84 ^s 69	52	45 ^h 01	+2 ^m 87	358 ^s 051	437	
14	36 ^h 48	2 ^m 32	250 ^s 21	52	45 ^h 16	2 ^m 87	19 ^s 488	443	
16	36 ^h 61	2 ^m 31	55 ^s 73	53	45 ^h 31	2 ^m 86	40 ^s 931	449	
18	36 ^h 73	2 ^m 31	221 ^s 26	54	45 ^h 46	2 ^m 86	62 ^s 380	454	
20	36 ^h 85	2 ^m 30	26 ^s 80	54	45 ^h 61	2 ^m 85	83 ^s 834	460	

*Enceladus.**Tethys.*

Greenwich Noon. 1892.	a_2	b_2	l_2-L	Diff.	a_2	b_2	l_2-L	Diff.
Jan. 22	36 ^{''} 96	+ 2 ^{''} 29	192 [°] 34	525 [°] 55	45 ^{''} 76	+ 2 ^{''} 83	105 [°] 294	381 [°] 466
24	37 ^{''} 08	2 ^{''} 28	357 [°] 89	.55	45 ^{''} 90	2 ^{''} 82	126 [°] 760	.471
26	37 ^{''} 19	2 ^{''} 26	163 [°] 44	.55	46 ^{''} 04	2 ^{''} 80	148 [°] 231	.476
28	37 ^{''} 30	2 ^{''} 24	328 [°] 99	.56	46 ^{''} 18	2 ^{''} 78	169 [°] 707	.482
30	37 ^{''} 41	2 ^{''} 22	134 [°] 55	.57	46 ^{''} 31	2 ^{''} 75	191 [°] 189	.487
Feb. 1	37 ^{''} 52	+ 2 ^{''} 20	300 [°] 12	.57	46 ^{''} 44	+ 2 ^{''} 73	212 [°] 676	.491
3	37 ^{''} 62	2 ^{''} 18	105 [°] 69	.57	46 ^{''} 57	2 ^{''} 70	234 [°] 167	.496
5	37 ^{''} 72	2 ^{''} 15	271 [°] 26	.58	46 ^{''} 70	2 ^{''} 67	255 [°] 663	.501
7	37 ^{''} 82	2 ^{''} 12	76 [°] 84	.58	46 ^{''} 82	2 ^{''} 63	277 [°] 164	.504
9	37 ^{''} 91	2 ^{''} 09	242 [°] 42	.59	46 ^{''} 93	2 ^{''} 59	298 [°] 668	.508
11	38 ^{''} 00	+ 2 ^{''} 06	48 [°] 01	525 [°] 59	47 ^{''} 04	+ 2 ^{''} 55	320 [°] 176	381 [°] 512
13	38 ^{''} 09	2 ^{''} 03	213 [°] 60	.59	47 ^{''} 15	2 ^{''} 51	341 [°] 688	.516
15	38 ^{''} 17	1 ^{''} 99	19 [°] 19	.59	47 ^{''} 25	2 ^{''} 47	3 [°] 204	.519
17	38 ^{''} 25	1 ^{''} 96	184 [°] 78	.60	47 ^{''} 34	2 ^{''} 42	24 [°] 723	.522
19	38 ^{''} 32	1 ^{''} 92	350 [°] 38	.60	47 ^{''} 43	2 ^{''} 37	46 [°] 245	.525
21	38 ^{''} 39	+ 1 ^{''} 88	155 [°] 98	.61	47 ^{''} 52	+ 2 ^{''} 32	67 [°] 770	.527
23	38 ^{''} 45	1 ^{''} 83	321 [°] 59	.60	47 ^{''} 60	2 ^{''} 27	89 [°] 297	.530
25	38 ^{''} 51	1 ^{''} 79	127 [°] 19	.60	47 ^{''} 67	2 ^{''} 22	110 [°] 827	.531
27	38 ^{''} 56	1 ^{''} 75	292 [°] 79	.61	47 ^{''} 74	2 ^{''} 16	132 [°] 358	.533
29	38 ^{''} 61	1 ^{''} 70	98 [°] 40	525 [°] 61	47 ^{''} 80	2 ^{''} 11	153 [°] 891	381 [°] 534
Mar. 2	38 ^{''} 65	+ 1 ^{''} 65	264 [°] 01		47 ^{''} 85	+ 2 ^{''} 05	175 [°] 425	

*Dione.**Rhea.*

Greenwich Noon. 1891.	a_4	b_4	l_4-L	Diff.	a_5	b_5	l_5-L	Diff.
Oct. 14	50 ^{''} 60	+ 1 ^{''} 07	324 [°] 467	262 [°] 875	70 ^{''} 66	+ 1 ^{''} 50	251 [°] 945	159 [°] 181
16	50 ^{''} 67	1 ^{''} 17	227 [°] 342	.878	70 ^{''} 76	1 ^{''} 63	51 [°] 126	.183
18	50 ^{''} 75	1 ^{''} 26	130 [°] 220	.880	70 ^{''} 87	1 ^{''} 76	210 [°] 309	.186
20	50 ^{''} 83	1 ^{''} 35	33 [°] 100	.884	70 ^{''} 99	1 ^{''} 89	9 [°] 495	.188
22	50 ^{''} 92	1 ^{''} 44	295 [°] 984	.886	71 ^{''} 12	2 ^{''} 02	168 [°] 683	.191
24	51 ^{''} 02	+ 1 ^{''} 53	198 [°] 870	.890	71 ^{''} 25	+ 2 ^{''} 15	327 [°] 874	.194
26	51 ^{''} 12	1 ^{''} 62	101 [°] 760	.893	71 ^{''} 38	2 ^{''} 27	127 [°] 068	.197
28	51 ^{''} 22	1 ^{''} 71	4 [°] 653	.896	71 ^{''} 53	2 ^{''} 39	286 [°] 265	.200
30	51 ^{''} 33	1 ^{''} 80	267 [°] 549	.900	71 ^{''} 68	2 ^{''} 51	85 [°] 465	.204
Nov. 1	51 ^{''} 44	1 ^{''} 89	170 [°] 449	.904	71 ^{''} 83	2 ^{''} 63	244 [°] 669	.208
3	51 ^{''} 55	+ 1 ^{''} 97	73 [°] 353	262 [°] 908	71 ^{''} 99	+ 2 ^{''} 75	43 [°] 877	159 [°] 211
5	51 ^{''} 67	2 ^{''} 05	336 [°] 261	.911	72 ^{''} 16	2 ^{''} 87	203 [°] 088	.214
7	51 ^{''} 80	2 ^{''} 14	239 [°] 172	.916	72 ^{''} 34	2 ^{''} 98	2 [°] 302	.219

Sup. 1891.

Satellites of Saturn, 1891-92.

573

<i>Dione.</i>					<i>Rhea.</i>			
Greenwich Noon. 1891.	a_4	b_4	$l_4 - L$	Diff.	a_5	b_5	$l_5 - L$	Diff.
Nov. 9	51° 93	+ 2° 22	142° 088	262° 920	72° 52	+ 3° 10	161° 521	159° 222
11	52° 06	2° 30	45° 008	° 924	72° 70	3° 21	320° 743	° 227
13	52° 20	+ 2° 38	307° 932	° 929	72° 89	+ 3° 32	119° 970	° 231
15	52° 34	2° 45	210° 861	° 934	73° 09	3° 42	279° 201	° 236
17	52° 49	2° 53	113° 795	° 938	73° 29	3° 53	78° 437	° 240
19	52° 64	2° 60	16° 733	° 943	73° 50	3° 63	237° 677	° 244
21	52° 79	2° 67	279° 676	° 947	73° 72	3° 73	36° 921	° 249
23	52° 94	+ 2° 74	182° 623	262° 953	73° 94	+ 3° 83	196° 170	159° 254
25	53° 10	2° 81	85° 576	° 958	74° 16	3° 92	355° 424	° 259
27	53° 27	2° 87	348° 534	° 963	74° 39	4° 01	154° 683	° 265
29	53° 44	2° 94	251° 497	° 968	74° 62	4° 10	313° 948	° 269
Dec. 1	53° 61	3° 00	154° 465	° 974	74° 86	4° 19	113° 217	° 275
3	53° 78	+ 3° 06	57° 439	° 980	75° 10	+ 4° 27	272° 492	° 280
5	53° 96	3° 12	320° 419	° 985	75° 35	4° 35	71° 772	° 286
7	54° 14	3° 17	223° 404	° 991	75° 60	4° 43	231° 058	° 292
9	54° 32	3° 22	126° 395	262° 996	75° 85	4° 50	30° 350	° 297
11	54° 50	3° 27	29° 391	263° 003	76° 11	4° 57	189° 647	° 303
13	54° 69	+ 3° 32	292° 394	° 008	76° 37	+ 4° 64	348° 950	159° 308
15	54° 88	3° 36	195° 402	° 014	76° 64	4° 70	148° 258	° 313
17	55° 07	3° 40	98° 416	° 020	76° 91	4° 76	307° 573	° 320
19	55° 26	3° 44	1° 436	° 027	77° 18	4° 81	106° 893	° 327
21	55° 46	3° 48	264° 463	° 033	77° 55	4° 86	266° 220	° 333
23	55° 65	+ 3° 51	167° 496	° 038	77° 72	+ 4° 91	65° 553	° 339
25	55° 85	3° 54	70° 534	° 045	78° 00	4° 95	224° 892	° 346
27	56° 05	3° 57	333° 579	° 051	78° 27	4° 99	24° 238	° 352
29	56° 25	3° 60	236° 630	° 058	78° 55	5° 02	183° 590	° 358
31	56° 45	3° 62	139° 688	° 064	78° 83	5° 05	342° 948	° 364
1892. Jan. 2	56° 65	+ 3° 64	42° 752	263° 070	79° 11	+ 5° 08	142° 312	159° 371
4	56° 85	3° 65	305° 822	° 077	79° 39	5° 10	301° 683	° 377
6	57° 05	3° 66	208° 899	° 083	79° 67	5° 12	101° 060	° 384
8	57° 25	3° 67	111° 982	° 089	79° 95	5° 12	260° 444	° 390
10	57° 45	3° 68	15° 071	° 095	80° 23	5° 13	59° 834	° 396
12	57° 65	+ 3° 68	278° 166	° 102	80° 81	+ 5° 13	219° 230	° 403
14	57° 84	3° 67	181° 268	° 107	80° 78	5° 13	18° 633	° 409
16	58° 04	3° 67	84° 375	° 113	81° 05	5° 12	178° 042	° 414
18	58° 23	3° 66	347° 488	° 120	81° 31	5° 11	337° 456	° 421
20	58° 42	3° 65	250° 608	° 125	81° 58	5° 09	136° 877	° 427

<i>Dione.</i>					<i>Rhea.</i>				
Greenwich Noon. 1892.	a_4	b_4	$l_4 - L$	Diff.	a_5	b_5	$l_5 - L$	Diff.	
Jan. 22	58 ^h 60	+3 ^m 63	153 ^s 733	263 ^s 131	81 ^h 84	+5 ^m 07	296 ^s 304	159 ^s 433	
24	58 ^h 79	3 ^m 61	57 ^s 864	137	82 ^h 10	5 ^m 04	95 ^s 737	439	
26	58 ^h 97	3 ^m 58	320 ^s 001	142	82 ^h 35	5 ^m 00	255 ^s 176	445	
28	59 ^h 15	3 ^m 56	223 ^s 143	148	82 ^h 60	4 ^m 96	54 ^s 621	450	
30	59 ^h 32	3 ^m 53	126 ^s 291	153	82 ^h 84	4 ^m 92	214 ^s 071	456	
Feb. 1	59 ^h 49	+3 ^m 49	29 ^s 444	158	83 ^h 07	+4 ^m 87	13 ^s 527	461	
3	59 ^h 65	3 ^m 45	292 ^s 602	163	83 ^h 30	4 ^m 82	172 ^s 988	466	
5	59 ^h 81	3 ^m 41	195 ^s 765	167	83 ^h 52	4 ^m 76	332 ^s 454	471	
7	59 ^h 96	3 ^m 37	98 ^s 932	172	83 ^h 74	4 ^m 70	131 ^s 925	476	
9	60 ^h 11	3 ^m 32	2 ^s 104	176	83 ^h 94	4 ^m 64	291 ^s 401	480	
11	60 ^h 25	+3 ^m 27	265 ^s 280	263 ^s 180	84 ^h 14	+4 ^m 57	90 ^s 881	159 ^s 485	
13	60 ^h 39	3 ^m 22	168 ^s 460	185	84 ^h 33	4 ^m 49	250 ^s 366	489	
15	60 ^h 52	3 ^m 16	71 ^s 645	188	84 ^h 51	4 ^m 41	49 ^s 855	493	
17	60 ^h 64	3 ^m 10	335 ^s 833	191	84 ^h 68	4 ^m 33	209 ^s 348	497	
19	60 ^h 75	3 ^m 04	238 ^s 024	194	84 ^h 84	4 ^m 24	8 ^s 845	500	
21	60 ^h 86	+2 ^m 98	141 ^s 218	197	84 ^h 99	+4 ^m 15	168 ^s 345	503	
23	60 ^h 96	2 ^m 91	44 ^s 415	200	85 ^h 13	4 ^m 06	327 ^s 848	506	
25	61 ^h 05	2 ^m 84	307 ^s 615	203	85 ^h 26	3 ^m 97	127 ^s 354	509	
27	61 ^h 14	2 ^m 77	210 ^s 818	204	85 ^h 38	3 ^m 87	286 ^s 863	512	
29	61 ^h 21	2 ^m 70	114 ^s 022	263 ^s 206	85 ^h 48	3 ^m 77	86 ^s 375	159 ^s 513	
Mar. 2	61 ^h 28	+2 ^m 62	17 ^s 228		85 ^h 58	+3 ^m 66	245 ^s 888		

The following are the approximate Greenwich times when the shadow of *Titan* crosses the central meridian, and when the satellite enters the shadow-cone of the planet. The times of some of the eclipses and shadow-transits of *Rhea* are also given, and it is very desirable that the latter should be carefully looked after, to ascertain whether the shadow cannot be discerned.

1891.	Gr. M. T.		1891.	Gr. M. T.	
Oct. 19	18 ^h 1	Tit. Shadow	Nov. 28	19 ^h 9	Tit. Ecl.
27	21 ^h 5	Tit. Ecl. Disapp.	Dec. 1	18 ^h 8	Rh. Sh. ?
Nov. 4	16 ^h 0	Rhea Sh. ?	3	22 ^h 9	Rh. Ecl.
—	17 ^h 3	Tit. Sh.	6	15 ^h 8	Tit. Sh.
6	20 ^h 2	Rh. Ecl.	10	19 ^h 7	Rh. Sh. ?
12	20 ^h 7	Tit. Ecl.	12	23 ^h 8	Rh. Ecl.
13	17 ^h 0	Rh. Sh. ?	14	19 ^h 1	Tit. Ecl.
15	21 ^h 1	Rh. Ecl.	19	20 ^h 6	Rh. Sh. ?
20	16 ^h 6	Tit. Sh.	22	0 ^h 7	Rh. Ecl.
22	17 ^h 9	Rh. Sh. ?	—	15 ^h 0	Tit. Sh.
24	22 ^h 0	Rh. Ecl.			

(To be continued.)

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Correction.

The values in the column "Corr. of log. Δ " in the Ephemeris for physical observations of *Jupiter*, p. 360 ff., are, owing to a mistake in transcribing the formula, considerably too large. The values should have been, at the beginning of June -34 , and at the end of November and beginning of December $+43$, and as these values do not affect the apparent distance of the fourth satellite by more than $0''.006$, the correction may be neglected. The heading β should have been B , and on p. 369, l. 13 and 14, 10^h should have been 9^h .

Erratum. By Harold Jacoby.

I desire to call attention to an error in my paper "On the Correction of Micrometric Measures for Refraction" (*Monthly Notices*, li. 2, p. 79). In the expression for $r-r'$ I should have used $(\xi-\xi')^3$, not $(\xi-\xi')^2$. The effect of this upon the result will be very small; and in the tables issued at the Royal Observatory, Cape Town, it may be entirely corrected by multiplying every number in Table I. β by $\frac{\cos(\pi-q)}{7.2}$, and afterwards multiplying the quantity taken from the table by σ^3 , not σ^2 . The correction $\beta\sigma^3$ will then always be positive.

Columbia College, New York:
1891 August 6.

Errata in Mr. Christie's paper, On a New Dome to be erected at the Royal Observatory, Greenwich, vol. li., no. 7.

Page 436, line 18, for diameter read radius.

" " 20, for 13 feet 3 inches read 17 feet 3 inches.